

M2 master internship project

Oxylipin screening in zebrafish: an *in vivo* approach to identify new bioactive lipids controlling macrophage function

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Macrophages are a heterogeneous population of innate immune cells, which play critical roles in wound healing. They can also drive chronic inflammation and impairs repair in diabetes, making them key therapeutic targets. Upon injury, they are rapidly recruited and adopt distinct phenotypes that support host defense and tissue repair. While macrophage polarization has been extensively studied *in vitro*, alternative *in vivo* models are urgently needed to uncover new modulators of macrophage function(s).

Ideally suited for live observation of immune cells, the zebrafish possesses similar immune cell types to mammals, including macrophages recapitulating polarization¹, anti-microbial defence, pro-inflammatory and reparative functions. Omega-3 and omega-6 polyunsaturated fatty acids (PUFAs) play important roles in human health as key precursors of many endogenous oxygenated lipids called oxylipins. Given their role(s) during inflammation, oxylipins are promising candidates for immunoregulatory effects on macrophages. The goal of this interdisciplinary project is to develop a screen test using the zebrafish to identify new endogenous bioactive lipids modulating macrophage phenotypes and characterize their activity on downstream macrophage functions in wound healing.

The student will split his/her time between IBMM and LPHI, engaging with both chemists and biologists. Synthesis of lipids will be performed at IBMM and experiments on zebrafish embryos at LPHI.

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